

CLAIMS

What is claimed is:

1. Apparatus for stowing and deploying a plurality of control surfaces of a guided air vehicle, said apparatus comprising:

a housing including: a plurality of slotted openings along an outside surface thereof; and a corresponding plurality of cavities within said housing,

each cavity extending to the outside surface of said housing through said slotted opening corresponding thereto and configured to accommodate span wise stowage of a corresponding control surface of the plurality,

each cavity having a section including an angled ledge and side wall support surface to accommodate stowage of the corresponding control surface in a span wise canted position with respect to the corresponding slotted opening.

2. The apparatus of claim 1 wherein each slotted opening extends along the outside surface of the housing to accommodate edge wise passage of the span of the corresponding control surface; and wherein each control surface is capable of being passed edge wise through the corresponding slotted opening to be folded into and deployed from the corresponding cavity of the housing.

3. The apparatus of claim 2 wherein each control surface folded into the corresponding cavity of the housing is capable of being stowed into the corresponding cavity section by canting the span of the control surface along the side wall support surface and resting a span edge of the control surface along the angled ledge.

4. The apparatus of claim 3 including a retaining cap rotatably coupled to a top of the housing, said retaining cap including a plurality of slots cut out from sides thereof, said retaining cap being rotatable to align said slots with corresponding slotted openings of the housing in first position to accommodate passage of tips of the control surfaces into corresponding cavities during folding and deploying thereof, and rotatable to offset said slots from corresponding slotted openings of the housing in a second position to prevent passage of the control surfaces from corresponding cavities during stowage thereof.

5. The apparatus of claim 4 wherein the housing is shaped substantially as a cylinder; wherein the slotted openings are substantially vertical to and spaced circumferentially about the surface of the cylindrical housing; and wherein the cavities corresponding to the slotted openings extend radially inward from the corresponding vertical slotted openings toward a cylindrical center.
6. The apparatus of claim 5 including four control surfaces spaced substantially 90° apart circumferentially about the surface of the cylindrical housing.
7. The apparatus of claim 5 wherein the retaining cap is substantially disk shaped and rotatably mounted to the cylindrical housing at a pivot point at a cylindrical center.
8. The apparatus of claim 4 wherein each control surface includes a span base, a span tip, a span trailing edge and a span leading edge; wherein the span base of each control surface is rotatably coupled through a base of the corresponding slotted opening to the housing.
9. The apparatus of claim 8 wherein each control surface is capable of being rotated edge wise through the corresponding slotted opening by the rotatable coupling.
10. The apparatus of claim 8 wherein each control surface folded into the corresponding cavity of the housing is capable of being rotated into the corresponding cavity section by the rotatable coupling.
11. Method of stowing and deploying a plurality of control surfaces of a guided air vehicle, said method comprising the steps of:

folding each control surface of said plurality edge wise through a corresponding slotted opening disposed along an outside surface of a housing and into a corresponding cavity within said housing;

moving each folded control surface into a stowage section of the corresponding cavity to edge wise mis-align each folded control surface from the corresponding slotted opening;

moving each control surface in the corresponding cavity from the corresponding stowage section into edge wise alignment with the corresponding slotted opening; and

deploying each control surface edge wise aligned with the corresponding slotted opening from the cavity through the corresponding slotted opening to a deployed position.

12. The method of claim 11 including the step of rotating each folded control surface into the stowage section of the corresponding cavity by canting a span of each control surface along a side wall support surface of the corresponding stowage section and resting a span edge of each control surface along an angled ledge of the corresponding stowage section.

13. The method of claim 11 including the step of rotating each control surface in the corresponding cavity from the corresponding stowage section into edge wise alignment with the corresponding slotted opening.

14. The method of claim 11 including the steps of: rotatably coupling a slotted retaining cap to a top of the housing; rotating the retaining cap to a first position to align the slots of the retaining cap with corresponding slotted openings of the housing to accommodate passage of tips of the control surfaces into corresponding cavities during the steps of folding and deploying thereof; and rotating the retaining cap to a second position to offset the slots of the retaining cap from corresponding slotted openings of the housing to prevent passage of the control surfaces from corresponding cavities during stowage thereof.

15. The method of claim 14 wherein the rotation of the retaining cap is driven by the movement of the control surfaces.

16. The method of claim 11 wherein the plurality of control surfaces are deployed simultaneously from their corresponding cavities of the housing to their deployed positions.

17. The method of claim 11 wherein the plurality of folded control surfaces are moved simultaneously into their corresponding stowage cavity sections of the housing.

18. The method of claim 11 wherein the plurality of control surfaces are moved simultaneously in their corresponding cavities from their corresponding stowage sections into edge wise alignment with their corresponding slotted openings.

19. The method of claim 11 including the steps of: rotatably coupling a span base of each control surface through a base of the corresponding slotted opening to the housing; and rotating each control surface edge wise through the corresponding slotted opening by the rotatable coupling.

20. The method of claim 11 including the steps of: rotatably coupling a span base of each control surface through a base of the corresponding slotted opening to the housing; and rotating each folded control surface to and from the corresponding stowage section by the rotatable coupling.